

What is claimed is:

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- (e) receiving a ticket voucher grant indicating that one of the plurality of second communication modules is capable of transmitting the first call signaling message over an outbound signaling link; and

- (f) in response to receiving the grant, routing the first call signaling message to one of the second communication modules based on address information in the call signaling message

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2. The method of claim 1 wherein transmitting a ticket voucher request message includes specifying a group number in the ticket voucher request message of communication modules capable of routing the first call signaling message to external nodes.

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3. The method of claim 1 wherein transmitting a ticket voucher request message includes addressing the ticket voucher request message to the first communication module.

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4. The method of claim 1 comprising starting a sequence timer in response to failure of the second signaling link, and wherein determining whether the linkset is on-hold includes determining whether the sequence timer has expired.

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5. The method of claim 1 wherein determining a signaling link to which the first call signaling message should be routed includes determining the signaling link based on message transfer part (MTP) information in the first call signaling message.

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6. The method of claim 5 wherein the MTP information includes the signaling link selection (SLS) code and the destination point code (DPC) in the first call signaling message.

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7. A method for processing ticket voucher request messages received in response to failure of a signaling link within a signaling node, the method comprising:

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(a) receiving, at a first communication module, a ticket voucher request message transmitted from a second communication module;

(b) determining whether the ticket voucher request message is intended for the first communication module;

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(c) in response to determining that the ticket voucher request message is intended for the first communication module, determining whether any grants are available based on the loading capacity of outbound signaling links associated with the first communication module; and

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(d) in response to determining that grants are available, issuing a grant to the second communication module.

8. The method of claim 7 wherein issuing a grant to the second communication module includes sending a ticket voucher grant message to the second communication module via an interprocessor message transport bus.

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9. The method of claim 8 wherein sending a ticket voucher grant message includes altering a request/grant indicator field in the ticket voucher request message and forwarding the modified ticket voucher request message over the IMT bus.

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10. The method of claim 7 wherein determining whether the ticket voucher request message is intended for the first communication module includes determining whether the ticket voucher request message is addressed to the group of the first communication module, and in response to determining that the ticket voucher request message is not addressed to the group of the first communication module, forwarding the ticket voucher request message over an interprocessor message transport (IMT) bus.

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11. The method of claim 10 comprising in response to determining that the ticket voucher request message is addressed to the group of the first communication module, determining whether the request has been granted, and, in response to determining that the request has been granted, forwarding the ticket voucher request message over the IMT bus.

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12. A method for performing flow control in a signaling node in response to signaling link failure using ticket voucher request and grant messages, the method comprising:

- (a) placing a linkset on hold based on failure of one or more signaling links in the linkset;
- (b) starting a sequence timer for the linkset;
- (c) receiving a call signaling message directed to one of the signaling links in the linkset;
- (d) storing the call signaling message in a queue; and
- (e) in response to expiration of the sequence timer, issuing a ticket voucher request message to cards capable of sending the call signaling message over an outbound signaling link.

13. The method of claim 12 comprising receiving a ticket voucher grant message in response to the ticket voucher request and, in response, sending the call signaling message to a card associated with an outbound signaling link.

14. The method of claim 12 comprising:

- (a) receiving a ticket voucher grant message;
- (b) determining whether the ticket voucher grant message is from a card associated with the linkset; and
- (c) in response to determining that the grant message is not from a card associated with the linkset, ignoring the ticket voucher grant message.

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predetermined time intervals and issuing a predetermined number of ticket voucher grants during each time interval.

5 18. A signaling node for using ticket vouchers to internally throttle call-signaling messages enqueued in response to signaling link failure, the signaling node comprising:

(a) a first communication module for determining whether messages are present in a ticket voucher queue and for issuing ticket voucher request messages in response to determining that messages are present in the ticket voucher queue; and

10 (b) a plurality of second communication modules for receiving the ticket voucher request messages, determining whether any ticket voucher grants are
15 available, and, in response to determining that ticket voucher grants are available, issuing ticket voucher grants to the first communication module, wherein, in response to receiving the ticket voucher grants, the first communication module forwards the call signaling
20 messages to one of the second communication modules for outbound processing.

19. The signaling node of claim 18 wherein the first communication module includes a ticket voucher request generator/grant

20. The signaling node of claim 18 wherein each of the second communication modules includes a ticket voucher request processor/grant manager for receiving the ticket voucher request messages and issuing the ticket voucher grants.

21. The signaling node of claim 18 wherein the first communication module includes a ticket voucher queue for storing the call signaling messages until the ticket voucher grants are received.

22. The signaling node of claim 17 wherein the first communication module is adapted to send the ticket voucher request messages only in response to determining that a linkset to which the enqueued messages are addressed is off-hold.

23. The signaling node of claim 17 wherein each of the second communication modules includes a grant timer for spacing issuance of the ticket voucher grants over a predetermined time interval.

24. A signaling node for using ticket voucher messages to internally throttle call signaling messages stored in response to signaling link failure, the signaling node comprising:

(a) a first communication module for receiving call signaling messages addressed to an on-hold signaling link and, in response, for enqueueing the call signaling messages and issuing ticket voucher request messages for the call signaling messages;

(b) a plurality of second communication modules for routing call signaling messages over outbound signaling links;

(c) a third communication module for monitoring the outbound signaling link processing capacity associated with the second communication modules and for issuing ticket voucher grant messages based on outbound signaling link processing capacity, wherein the first communication module forwards call signaling messages to the second communication modules in response to the ticket voucher grant messages.

25. The signaling node of claim 24 wherein the third communication module is adapted to apply a burst management algorithm when issuing the ticket voucher grant messages.

26. A computer program product comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

- (a) receiving a plurality of call signaling messages from an inbound signaling link that are directed to an outbound signaling linkset that has been placed on hold;
- (b) buffering the call signaling messages for a predetermined time period;
- (c) in response to expiration of the predetermined time period, issuing ticket voucher request messages to outbound communication modules;
- (d) receiving ticket voucher grant messages from the outbound communication modules; and
- (e) routing the call signaling messages to the outbound communication modules in response to the grant messages.

27. The computer program product of claim 26 wherein receiving call signaling messages from an inbound signaling link includes receiving call signaling messages from a service switching point (SSP).

28. The computer program product of claim 26 wherein receiving call signaling messages from an inbound signaling link includes receiving call signaling messages from a signal transfer point (STP).

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